oil of turpentine and substances allied to the terpenes have the property of transforming oxygen into ozone. There is no doubt whatever that ozone is soluble in oil of turpentine; this is incontestably proved by the experiments of Soret, who, as all chemists know, has made capital use of the fact, but this is quite another thing to saying that oil of turpentine *generates* ozone. This confusion between ozone and hydrogen peroxide has mainly arisen from the difficulty of discriminating between the two substances, and it is only since the researches of Struve, made about ten or eleven years since, that the presence of the latter body in the air may be said to have been demonstrated. Observers were led astray by the supposition that the simultaneous existence of the two substances was impossible; chemically speaking, they were held to be incompatible. Recent observations have shown that the opinions hitherto held on this point must be modified. We are at present very much in the dark as to the causes which lead to the formation of peroxide of hydrogen in nature, but that many plants, and especially those which secrete essential oils, contribute to its production is almost certain. In the book before us Mr. Kingzett has collected a mass of evidence on this matter, and has presented it in an eminently readable and interesting form. Perhaps the most valuable part of the work is that which relates to the power exercised by the various members of the genus Eucalyptus in preventing or destroying malaria—which power according to our author is related to their property of forming peroxide of hydrogen.

The *Eucalyptus globulus* was discovered by Labillardière in Tasmania towards the close of the last century, but it is only within the last quarter of a century that its anti-miasmatic properties have become known to Europeans. To whom the credit of the discovery is due is not clearly made out. M. Ramel, Baron Müller, and Sir W. Macarthen appear to have been among the first to draw attention to its extraordinary power, and seeds of the tree were sent by them from time to time to Europe. The testimony in support of this power is most convincing. In marshy districts near Eucalyptus forests fever seems to be unknown, and in parts of Corsica and Algeria where the tree has been planted for the sake of its reputed virtues endemic fevers have been stamped out. M. Gimbert, in a report to the French Academy, instanced the case of a farm situated in a pestilential district about twenty miles from Algiers, where by planting a number of the trees the character of the atmosphere was entirely changed. Similar testimony comes from Holland, the South of France, Italy, California, and many other parts of the world as to the febrifugal attributes of this tree In no case is the evidence more convincing than in that of Algeria, as we have it related to us by Dr. Santra, and, quite recently, by Consul Playfair. Large tracts of land have been quite transformed by the agency of the "fever-destroying tree" as it has come to be called, and wherever it is cultivated fevers are found to decrease in frequency and intensity. Fewer districts in Europe have a more evil reputation than the Campagna as a veritable hot-bed of pestilential fever, and people who know the country round Rome may remember the monastery at Tre Fontane on the spot, as tradition tells, that St. Paul met his death. Life in this monastery meant death to the monks, but since the Eucalyptus has been planted in the cloisters fever has disappeared and the place has become habitable.

That the aromas of plants have in all ages been held to act as preventives of disease, especially against those of an infectious or malarial type, is well known, and in every visitation of plague which has afflicted this country we read of people carrying strong-smelling gums or balsams about their persons. The physicians of a bygone time had vinaigrettes in the handles of their canes to protect them from the exhalations of their patients, and the miserable wretches who came out of the fever-haunted prisons and bridewells of a century or two ago to stand their trials were surrounded by some aromatic herb to protect the court from possible contagion. Even the chaplain as he accompanied the doomed man to the gibbet had presented to him a bouquet as a precaution against the dreaded jail-fever.

Whether peroxide of hydrogen is invariably produced by the process of oxidation of the aromatic parts of plants is not yet proved, but that it frequently is so seems beyond question. There can be no doubt too that this substance is a very powerful antiseptic; the experiments of Mr. Kingzett and others are quite conclusive on this point.

OUR BOOK SHELF

The Science of Voice Production and Voice Preservation, for the Use of Speakers and Singers. By Gordon Holmes, Physician to the Municipal Throat and Ear Infirmary. (London: Chatto and Windus.)

THE author says that this work is an abridgment of his "Vocal Physiology and Hygiene," of which a notice has already appeared in NATURE (vol. xxi. p. 271), and that it is intended "to furnish persons who make an artistic or professional use of the vocal organs with a concise account of those relations of the voice to physical and medical science which are only cursorily alluded to, or passed over altogether, in treatises on elocution and singing."

The account is concise enough, in the sense of not occupying much space, if we omit the chapter headed "Hygiene of the Voice," which is mainly occupied with general hygiene; but we greatly doubt whether those who "make an artistic or professional use of the vocal organs" will derive much advantage from its study, that is, whether they will be able to carry away much that will be of use to them. In striving to be concise the author seems to have become vague. Although, of course, he must be professionally well acquainted with the details of the vocal organs and their laryngoscopic appearance, he has not succeeded in conveying a clear knowledge of so much as it imports the singer and public speaker to know. Nor are his woodcuts of the larynx at all satisfactory; those, for example, of "the larynx when sounding a note about the level of the ordinary speaking voice," and "during the emission of falsetto notes," being calculated to convey false impressions to those who see them for the first time. His knowledge of the physics of sound, and especially of phonetics, appears to be entirely secondhand. There is the same impression conveyed by his treatment of the registers and voice training for singers. The consequence is a want of definiteness and exactness in all these important branches of his subject. Thus, on p. 2, he tells us that sound travels through air at the rate of about 1,090 feet in a second, but neglects to add "at freezing temperature," or that it goes faster when the air is heated, so that, in fact, about 1,120 feet at 60° F. is the more common rate. At

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other times his language is rather singular, as when he says that stammering "frequently arises from a muscular defect, giving rise to a *clumsiness in getting the tongue round one or more letters*" (p. 94), or speaks of the vocal bands being "tensed" (p. 105), or says that "musical gifts of voice are rather *phylogenetic* in their origin," the word in italics not appearing even in Mayne, or speaks of "living up hills" (p. 146). In a book written for singers and public speakers Latin and Greek and technical expressions should certainly be explained, if not avoided, such as *phylogenetic*, already adduced, and *frænum linguæ* (p. 95). The article on hygiene conveys a good deal of information, but we suspect most readers will rather remember the amusing account of the dietetic habits of singers, quoted from other sources, on p. 114, than be able to dig out what relates to the voice from the great mass of other matter. In conclusion, we cannot help feeling that the words "the science of," in the title, are not justified by the book itself, and might be advantageously replaced by the single word "on."

Ceylon Coffee Soils and Manures: a Report to the Ceylon Coffee Planters' Association. By John Hughes. (London: Straker Bros. and Co., 1879.)

THE writer of this report has at least gathered together a large amount of useful information about the coffee plant, coffee soils, and coffee manures. As an agricultural chemist he has, not unnaturally, attributed excessive importance to the composition and condition of the soils in which healthy and diseased coffee trees are found; manures also are indicated as amongst the chief remedial measures. Doubtless, the proper maintenance of the "condition," as it is technically termed, of coffee soils has been woefully neglected. Indeed, where there is neither rotation nor even alternation of crops the difficulty of securing continued vigour of growth and ample crops of fruit must be considerable, even when soils are rich and seasons favourable. But let any adverse influences, whether of excessive rainfall, or of mechanical and chemical injury to the soil occur, and then the plant is more likely to succumb to the attacks of its enemies, vegetable and animal. Thus wheat straw deprived of adequate supplies of soluble silica becomes more subject to injury from insects and mildew. Other examples might be found of a connection between certain deficiencies in the soil and certain diseases in the plant, but it is unsafe to make a hasty generalisation on this point. In combating the coffee-leaf disease we must first of all devote ourselves to the fungus which is its direct cause. There can be little doubt that calcium sulphide, which proved so efficient a means of destroying the *Oidium* of the vine will be equally destructive to the *Hemileia vastatrix*. A mixture of sulphur and quicklime, or a wash made by simply boiling these two materials together, is much less active.

When Mr. Hughes makes suggestions about the sources of manurial substances available for Ceylon, about the making and preservation of cattle and vegetable manure, and about terracing and draining, we can heartily endorse his recommendations. And when he gives us a number of careful analyses, some of which are of considerable interest, even apart from their connection with the growth of coffee, we are grateful for information which is sure to become useful under some circumstances and at some time. But there are certain portions of Mr. Hughes's Report which seem to have been introduced with no special object, or which are of questionable value. We hardly need to be taught that "Planters want a practical remedy rather than an elaborate description of the disease" (p. 140). The appearance of what look like recommendations of the manurial preparations of particular manufacturers should have been avoided (pp. 27 to 30). We could have spared the repetition of the well-worn table of manurial values on p. 100, and the analysis of Bude sand (p. 36). The term *granitic* as applied (p. 37) to a limestone containing over 70 per cent. of calcium and magnesium carbonates needs a word of explanation. Of really interesting data furnished by Mr. Hughes we may cite the analyses of castor-seed cakes (p. 15), in which the nitrogen is shown to differ widely—brown and black cakes containing but $4\frac{1}{2}$ per cent., while white cakes show no less than $7\frac{1}{2}$. Although we do not believe in the third decimal places (how often can we chemists secure accuracy in the tenths?) in Mr. Hughes's soil analyses (pp. 46, 53, 65, 72, 77, 81, 150)—particularly as his phosphoric acid determinations were not made by the molybdic acid process—yet these results represent a mass of laborious researches, and ought to furnish much material for the management of Ceylon coffee soils. The analyses of healthy and diseased coffee-leaves (pp. 142-144) deserve careful study; they point unmistakably to the fungoid origin of the disease.

A. H. C.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

Cloud Classification

BETWEEN M. Poëy and his latest critic (NATURE, vol. xxii. p. 96) it would be impertinent for me to interfere. But until my objection to a part of Howard's original classification has met with some response from those who maintain the adequacy of that classification I must continue, at the risk of some repetition, to call attention to this objection. It can be stated briefly, and I do not see why the answer thereto, if such exist, should be deferred as too long for discussion.

E. H. appears to admit that an observer, when within a cloud (which is then to him a fog), cannot distinguish *cumulus* from *stratus*. He, however, elevates the stratus, or rather one variety of it, "a few feet (or even inches) from the earth," so as to cut "the taller trees in a horizontal line, leaving their tops and bottoms free." He proposes to shelve the question "whether it is desirable to use the term 'stratus' for clouds in a totally different sky region, which differ both in their origin and their nature from the true stratus" (*i.e.*, from the *stratus* of the sky-region of half-length elms in the Thames basin). Now it is precisely this question which the large and growing class of observers, who wish to record the modifications of clouds, can no longer permit to be left unsettled. If clouds are to be classified according to their form at all, some name is absolutely required for a class of clouds which is in all latitudes common, and in the higher predominant. These are the clouds to which the observers can neither give the title *cumulus* nor the title *cirrus*, the clouds which are disposed in beds or layers whose vertical thickness is small. When in trifling amount they arrange themselves in irregular disks or patches capable of being occasionally mistaken for *cumulus* when in the zenith, but elsewhere seen as streaks or threads transverse to the meridian. When in large amount they cover a great portion or the whole of the sky with a shallow and nearly level canopy. In England, putting together observations made at all hours of day and night, clouds belonging to this class are recorded in about 60 per cent. of the observations. Of observations made at 2 p.m. they occur in about 38 per cent.; of observations made between sunset and sunrise in upwards of 90 per cent. Of observations made at all hours in the English Midlands from October, 1879, to February, 1880, inclusive, they were recorded in 83 per cent. To leave this class nameless is intolerable. To give to them either of the compound titles *cumulo-stratus* and *strato-cumulus* is objectionable, because in form they do not resemble *cumulus* at all (I might add that to a defender of Howard's unamended system they also do not resemble *stratus* at all, differing, as we are told, not only in elevation, but in "origin and nature," both from ground-fog and middle-tree fog). A similar objection lies against the application to these clouds of

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